

## Methyl Bromide (MeBr) Contamination in Idaho Potato Fields - (Update 05/12/2017)

### Background:

- Pale Cyst Nematode (PCN) was identified in 26 Idaho potato fields in 2006. This was the first time PCN had been identified in the U.S. The pest can reduce potato yields up to 80%. As a result, Canada, Mexico, Korea and Japan cut off importation of potatoes from Idaho and a Federal Domestic Quarantine was placed on the infested fields totaling 2,300 acres.
- In 2007, Idaho State Department of Agriculture (ISDA) and USDA-Animal and Plant Health Inspection Service (APHIS), began treating the fields in the fall and spring with the soil fumigant Methyl Bromide (MeBr).
- In 2014 and 2015, one of the farmers growing alfalfa hay on their MeBr treated fields subsequently fed the alfalfa to their own livestock which eventually got sick. The cattle experienced lethargy, weakness, open sores, and calf mortality.
- Blood and tissue samples from the cows confirm high inorganic bromide concentrations.
- The farmers and APHIS took hay samples and soil samples. The soil samples showed virtually no detectable inorganic bromide residues; but the alfalfa hay contained residues ranging from approximately 4,000 to 10,000 ppm.
- Subsequent sampling showed numerous fields and crops with elevated levels of inorganic bromide residues, including wheat, barley, corn, potatoes, beans, peas, oats and alfalfa.
- MeBr rapidly degrades and converts to inorganic bromide residues that remain in the soil and are taken up by some crops at high concentrations.

### Determinations/Actions Made to Date:

- Since 2015, ISDA, APHIS, Idaho Department of Environmental Quality (IDEQ) and EPA Region 10 have been working together as the MeBr Task Force, led by ISDA, to address and resolve issues and farmer concerns as a result of MeBr contamination of fields and crops.
- EPA determined that residues of inorganic bromide below 50 ppm for most crops and 75 ppm for potatoes would not cause harm for humans nor animals.
- The Food & Drug Administration (FDA) concluded that crops grown on the MeBr treated fields with low residues of inorganic bromide (below 50 ppm and 75 ppm for potatoes) can safely and legally enter the commercial food market.
- Growers can safely and legally sell potatoes, barley grain and wheat grain with low inorganic bromide residues (below 50 ppm).
- Large quantities of hay and straw with high inorganic bromide levels (above 50 ppm) cannot be sold or used as livestock feed.
- In 2016, Region 10 used RARE funding to work with ORD to study the pollutants generated by burning the crop material either in the field or in a portable incineration unit. The study was completed in February, 2017, and the results have been shared with the Task Force.
- High concentrations of bromine and chlorine were detected in the lab study. The VOCs chloromethane, bromomethane, acrolein, vinyl acetate and n-Hexane were identified. Formaldehyde, naphthalene, brominated dioxins and furans, and chlorinated dioxins and furans were also found.
- ISDA and APHIS are coordinating the disposal of approximately 5,000 one-ton hay and straw bales harvested in 2015 & 2016 with high inorganic bromide residues.

#### Disposal Challenges and Status of Options:

- The Task Force has not yet found a cost-effective solution to annual disposal nor has it found a consistent funding mechanism to cover disposal costs.
- Options under consideration for addressing the unusable crops with high inorganic bromide residues include: leaving them on the fields to decompose, sending them to a local landfill, burning them in the field or in an incinerator, or pelletizing and burning them in a bio-energy facility.
- Landfill disposal appears to be the most viable option for most of the existing hay and straw that need disposal and three landfills have been identified as possible sites. Transportation and disposal costs will be significant, and landfill capacities may vary from year to year.
- Regarding the option to pelletize the crops and burn them in a local bio-energy potato processing facility, Idaho National Laboratory is assessing the risks and viability of pelletizing the contaminated crops and establishing a commercial market. The status of this option is unclear.
- Boise State University and University of Idaho have completed a research project to evaluate the ability of various crops to uptake and remove the inorganic bromide residues from the soil. This will help farmers identify crops that are most effective for bioremediation and identify crops with low inorganic bromide residues, which can safely be grown on the contaminated fields in the future.
- The ORD air emissions information could be used by Idaho DEQ to evaluate the risk posed by burning contaminated hay and straw, and to develop an air permit required for field or portable incinerator burning. To date, IDEQ has not received a permit application from ISDA or APHIS.

#### 2017 Growing Season:

- In 2017 most growers with contaminated fields will plant alfalfa, potatoes, barley and wheat.
- The Task Force anticipates an estimated 4,000 to 5,000 ton bales of harvested material that will need disposal.
- The potatoes, barley grain, and wheat grain are expected to be marketable commodities (provided they fall below the FDA residue thresholds), but the barley straw, wheat straw and alfalfa hay will need to be disposed of.
- Alfalfa is being used to bio remediate the contaminated fields, so farmers are planting it to cleanse the soil of inorganic bromide.

#### Summary: EPA's Role to Date:

- Since 2014, EPA has been involved in the Task Force, but Task Force communications have dwindled during 2017.
- EPA assisted in determining the safe levels for inorganic bromide residues in crops, and also in the burn study conducted by ORD.
- EPA Region 10 provided \$10,000 in 2016, through pesticides cooperative agreement funding to ISDA, to help pay for removing manure and soil from a producer's livestock corral.
- EPA researched landfill capacity and transportation costs for disposing of contaminated hay and straw

bales. ISDA & APHIS are coordinating the disposal of the 2015 and 2016 crops, but EPA is not part of that action.